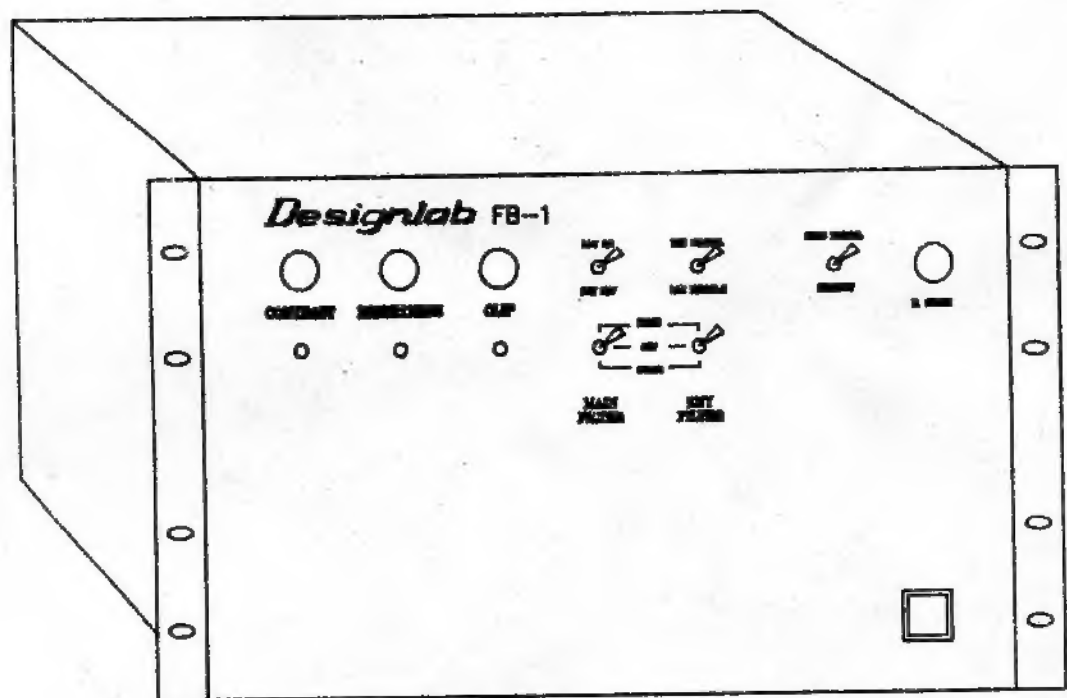


FB-1

USER GUIDE



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FB-1 Frame Buffer System

INTRODUCTION

THE SYSTEM:

The FB-1 frame buffer is an expandable, multi-frame, image storage system. It comes in many configurations. Options include extra frames, extra inputs & outputs, and colorizing.

The FB-1 can be controlled by a computer or by the optional FBRM-1 remote control unit. It can also be used stand-alone as a single frame unit.

The FB-1 should be thought of as a system instead of as a single machine. The simplest version only has one input and output, but typical versions might have two or three inputs and four or five outputs. The inputs, outputs, and frames (memory) can all be patched by the computer into a number of different configurations. For example, you can have four cameras going into four separate frames, and sequence the four cameras out to four monitors. The computer could change which frame each camera goes into, and which frame you see on each monitor. This configuration requires three extra input/output boards and three extra memory boards.

The simplest configuration has sixteen frames of black and white video (16 shades of grey) at 256x256 resolution.

GETTING STARTED:

The FB-1 is very simple to connect and to use. The basic B&W version requires four standard sync signals and two video signals. It puts out one black & white video signal. If you have one of the color options, you need two more sync signals and it will put out a color signal on a separate output.

Start by connecting the sync signals. Each sync input has two BNC connectors that are tied together. This is called a loop-thru input. Loop-thru inputs allow you to pass one set of sync signals to a number of machines, usually with no problems. The signals need to be terminated by a 75 ohm terminator at the last machine in the chain.

If you have a black and white version, you need Blanking, Comp. Sync, H.Drive, and V.Drive. If you have a color version, you also need Burst Flag and Subcarrier (3.58 MHZ).

Next connect the video inputs. They are also loop-thru inputs. You can connect a camera into the main input and loop it over to the key input. You could then loop the signal over to a monitor to preview the camera. You could instead feed two cameras in, one to the main input, and one to the key input. The signals must be terminated by a 75 ohm terminator at the last machine in the chain.

The video output should be connected to a VCR, an S.E.G., or a monitor.

Make sure the power switch is in the off position by pushing on the bottom half of the power switch. Now plug the power cord into the back of the FB-1. Plug the other end into a 110 volt AC, grounded power outlet. This outlet must be grounded for safe, noise-free operation. The outlet must be able to handle a 300 watt surge. The FB-1 only needs 50 to 100 watts to run, but has a surge of about 300 watts when you turn it on.

If you have a computer interface or the remote control unit, you should plug the ribbon cable supplied with it into the long skinny connector on the back of the FB-1. Be careful when you plug this in. It only fits in one direction. These connectors are "keyed" on one side. There are two methods of keys. One style has a tab in the middle of one of the long sides of the cable connector. The other style has two slits, one near each end of one of the long sides of the cable connector. The cable is plugged in with the key facing up. If you have a multi-colored ribbon cable, the stripe on the left will be black, and the stripe on the right will be brown. If it doesn't fit, look at the pins on the FB-1 connector to make sure they aren't bent. **DO NOT FORCE THIS CONNECTION!** Refer to the instructions that came with your interface for information on how to connect the interface to your computer. (see chapter x of this manual for more information.)

You are now ready to turn on the FB-1. Set the control knobs on the front panel to their center positions. Set the key switches to OFF and REVERSE. Set the sync switch to EXT. Set the filter switches to the COLOR setting. These are the default settings that you should go back to when you get confused.

Turn on the FB-1 by pushing on the top of the power switch. The power switch should light up and you should hear a fan in the back. If this does not happen, then refer to the trouble-shooting section in the back of this manual.

SYNC

SYNC CONTROLS:

The FB-1 has two sync controls. The Phase control is used to line up the edges of the output with the blanking edges of the monitor. This knob may have to be set if the temperature changes a lot, or if you change sync generators. Once the machine has been running for a few minutes, you usually don't need to change the setting of this knob.

The other sync control is the NORMAL/STANDBY switch. The NORMAL setting is for normal operation. The STANDBY position is used when you are changing sync sources. If you are genlocking to a tape, you should set the switch to the STANDBY position before turning off the VCR. This will prevent glitches in the image due to loss of sync.

BLACK & WHITE INPUT/OUTPUT

MAIN VIDEO CONTROLS:

Most FB-1's have at least one B&W input/output. There can be up to four of these. Each B&W input has three control knobs and four switches. The control knobs also have voltage control inputs that let you control the knobs with an oscillator, a remote control panel, or a computer (requires D-A's on the computer).

The Contrast and Brightness controls are very simple. They control the contrast and brightness of the video input. Once a frame has been frozen, these controls have no effect.

The Main Filter switch is used to improve the quality of the Main video input. In the OFF position there is no filtering. In the COLOR position, the color portion of the Main video input is removed. A color signal on the input does not come out in color, it causes stripes or grids to show up in the image. The COLOR setting will reduce these stripes but may not totally eliminate them. The NOISE position will remove noise from the input, but makes the image slightly out of focus, so use this setting with care.

KEY VIDEO CONTROLS:

The Key controls are not as easy to explain as the main controls. The Key section is used to define an area on the screen. In this area, the main video will grab new images. The rest of the screen will hold the old image. This leaves trails on the screen as the key image moves around. The Key video can come from a different camera than the main video, or it can come from the same camera.

The Key Clip control is used to select a shade of grey from the Key video input. All shades of grey lighter than that shade define the Key area (if the NORMAL/REVERSE switch is set to NORMAL). With the switch set to REVERSE, the Key area is defined by all shades darker than the Clip setting. For example, let's say the key camera is pointed at a white circle on a black background. With the Clip control set in the middle, the Key switches set to NORMAL and ON, the inside of the circle will have the Main video in it. The rest of the screen will be whatever image was there before you started Keying.

The Key Filter switch works the same as the Main Filter switch, only it works on the Key video input. With a color image going into the Key input, the Key area will have patterned edges. By using the COLOR setting you can clean up those edges. The NOISE setting will clean up the edges even more, but may smear small details in the Key area. The Key Filter switch does not affect the Main video in any way.

OUTPUT:

There are no controls on the black and white output. This output is always active, even if you add the digital colorizer.

THE FRAMES:

The video is stored as a series of frames in a large memory bank. This memory is similar to the memory in a computer, except there isn't a computer in the standard FB-1. The FB-1 has at least 500,000 bytes (1 million pixels) of memory and can be expanded to many times that. This translates to sixteen frames of 256 by 256 at 16 shades of grey. Using 16-frame memory boards, you can have 64 frames. Using the new 128-frame memory boards, you can have 512 frames. We can also build custom memory arrays that can give you thousands of frames.

You need a computer to get full use of the frames. At the time of this printing we recomend the Amiga computer. It works well as a controller and does a lot without the FB-1. In order to use the computer, you need one of our Computer Interface boards (or modules), and a program. Through the interface, the computer can control which frame goes out of the FB-1. The computer can tell the FB-1 when to grab a new frame, or what order to play the frames in. It can also control how often you change frames, stretching the amount of time you can store in the FB-1.

In a system with more than one input/output, there are some restrictions. You must have at least one memory board per input. You can only access one frame per memory board at a time. Two inputs can not use the same frame at the same time. Two (or more) outputs can share a frame, and each input has a seperate grab control. Frames can be grabbed in a sequence from several inputs, as long as only one input goes to any specific frame. With certain computers, you can run several programs at once, which lets each input/output act as a seperate buffer.

EXPANSION:

There are several ways to expand the FB-1. There can be up to four B&W inputs and outputs. Each of the outputs can have a digital colorizer (or two). The number of frames can go up to 512 (even more in the future).

There are several options being developed for the FB-1 that will greatly increase it's capabilities.

They include:

- | | |
|---------------------------|--|
| - True Color Input/Output | Lets you grab true color images. |
| - Frame Repositioner | Move the frame up & down, or side to side. |
| - Formula Processor | Miniature image processor |
| - Buffer I/O | Multi function expansion board that includes: |
| Resolution control | 12 resolutions, 64x64 to 256x512. |
| Sketching | Draw lines, dots, etc. in the buffer. |
| Archive | Save images on your computer's disk. |
| Animation | Retrieve pieces of images from disk in long sequences. |

Each of these options needs software to work. How much software is available will vary from computer to computer.

Each option must be installed and tested by us. They can not be done just by plugging in a board (in most cases).

COMPUTER INTERFACE:

We have interfaces for several computers, and plan to make interfaces for most of the popular computers. We can also custom-build an interface for almost any computer, or even supply the computer. The interfaces usually plug into an expansion connector or a slot inside the computer. Instructions are included with each interface and should be added to this manual right after this page.

You will need software to use the interface. We have at least one program for each interface, and it is supplied with the interface. Information on each program is in with the interface.

AMIGA INTERFACE MODULE

INTRODUCTION:

The Amiga interface module is a box that plugs onto the side of the Amiga. It contains an interface board that lets the Amiga control most of the functions of the FB-1 frame buffer.

Installation:

Make sure that the Amiga and the FB-1 are both turned off. On the right side of the Amiga there is a long narrow slot covered by a strip of plastic. Look for a rectangular cut in the plastic. At the bottom of the rectangle is a notch. Using your fingernail, or a small screwdriver, pull on the notch and the rectangle will come off. Under it you will see an opening with a thin 'blade' sticking out. This is the edge of a circuit board.

Pick up the interface module and unwrap the cable. One end of the cable is attached to the inside the interface, the other end goes into the back of the FB-1.

On the side of the interface module is a long connector that mates with the edge of the circuit board on the Amiga.

The module should be carefully pushed onto the side of the Amiga. The module must have it's cable coming off the back of the Amiga, and the small light should be on the front. **DO NOT FORCE THE MODULE ON!** Carefully line up the slot in the connector with the circuit board edge and then push the module up against the computer. If it does not go on easily, get an engineer or Amiga dealer to show you how. If you force it on, you might damage your Amiga permanently. This module is actually very easy to install, but it must be done right.

Now connect the other end of the cable to the FB-1. This connector can only be put on in one direction. If you force it on you might damage the FB-1. There is a tab on one side of the cable connector that mates with a slot in the FB-1 connector. **DO NOT FORCE THIS CONNECTION!** If it does not attach easily, look closely at the connector on the FB-1 to see if there are any bent pins.

Never plug the computer into the FB-1 while either the computer or the FB-1 is turned on. This could permanently damage both machines.

SOFTWARE:

The information on specific programs is included with the software and should be added to this manual right after this page. Typical programs control the speed of grabbing, speed of playback, which frames you can see, and when to grab a frame.

AMIGA SOFTWARE

BufPalette:

This is a general control program for an FB-1 with a digital colorizer option. It is supplied with the colorizer option. It can be run from workbench by selecting it's icon. It can also be run from the CLI by entering BufPalette.

BufPalette opens a custom screen on the Amiga, resets the colors in the FB-1 color palette, and puts up a control panel in the middle of the Amiga screen. On the control panel are four slide pots, and 21 push-buttons. You use the mouse to control all the features. Using the mouse, point to one the pushbuttons and click the left mouse button. To use the slide pots, you must point to one of the slide pot knobs, hold down the left mouse button and move the mouse.

The digital colorizer takes the 16 shades of grey from a B&W output and translates them into sixteen colors. You have 4096 colors and greys to choose from, but only sixteen can be seen at once.

The speed control sets the rate of grabbing or playback. It works like a slide pot, and as you slide it up and down, you will see the grab rate change.

The grab button is used to switch between storing and playback. The program comes up in the playback mode.

The pause button is used to stop and start the sequence of frames. It starts out in the sequence mode. When you hit it, it stops the sequence. Hit it again and the sequence starts up again.

The reverse button is used to reverse the order of playback. First you grab a sequence of frames, then while playing them back you hit the reverse button and the motion goes backwards.

The 16 buttons that represent the 16 shades of grey in the FB-1 are used to choose one of the shades to modify. The colors in the boxes should be close to what the FB-1 colors are.

There are three slide pots for mixing the color that you are controlling. They represent how much red, green, and blue to mix together for the color that you want.

The reset button will reset all the colors to the grey scale.

The exit button is used to exit this program.

NOTE: Always back up your programs, put the original disk in a safe place, and run off of the backup copy.

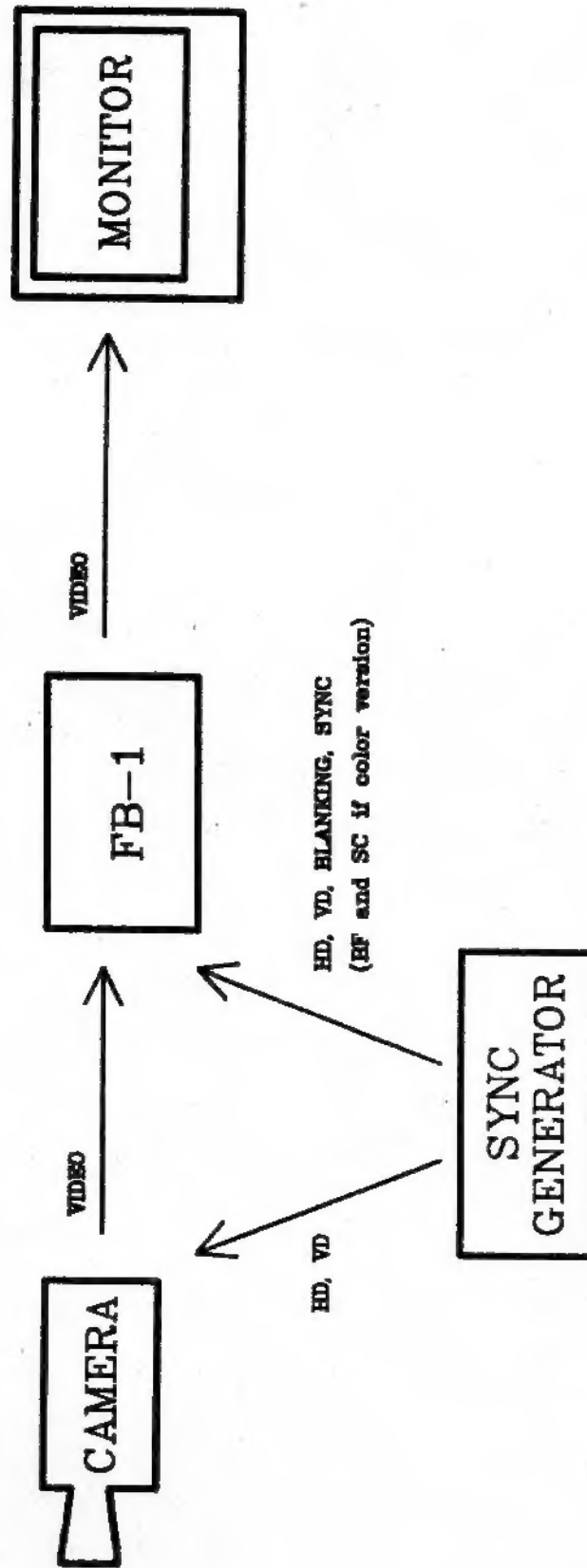
AMIGA SOFTWARE

BReset:

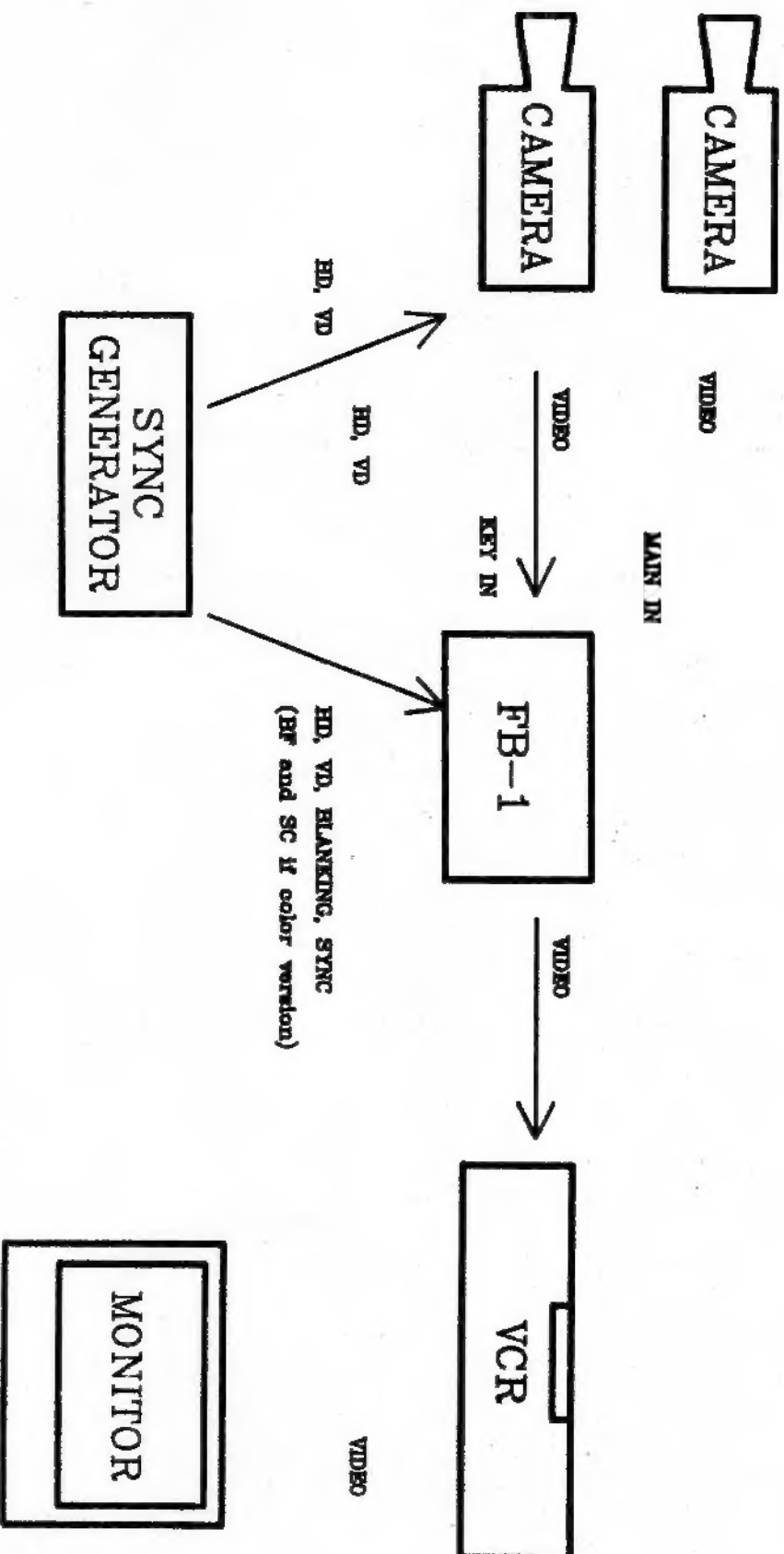
This program resets the bufer so that the computer can be turned off. It runs and returns right away. Without the computer you only have one frame.

NOTE: Always back up your programs, put the original disk in a safe place, and run off of the backup copy.

FB-1 Minimum Configuration



FB-1 Simple System



FB-1 EXAMPLE SYSTEM

